

WHAT IS CLAIMED IS:

1. A light beam scanning apparatus, in which light beams scanned from an image head form spots on a photosensitive drum to form an image, the image head comprising:

light emitting means comprised of a plurality of light emitting sources arranged to be perpendicular to a rotation axis of the photosensitive drum to output multiple beams in response to video signals; and

a lens system for allowing the multiple beams output from the light emitting means to form spots on a surface of the photosensitive drum in a linear shape along a vertical direction of the surface thereof; and

wherein a focus of light beams having passed through the lens system is formed at a central axis of the photosensitive drum when viewed in a sub-scanning direction, thus enabling spots of the light beams to be vertically formed on the surface of the photosensitive drum in a linear shape when viewed in a main scanning direction.

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2. The light beam scanning apparatus according to claim 1, wherein the lens system comprises:

a collimator lens for converting the multiple beams emitted from the light emitting means to parallel beams;

a cylinder lens for refracting the multiple beams,

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converted to the parallel beams by the collimator lens, in the main scanning direction; and

a plus lens for focusing the multiple beams having passed through the cylinder lens on the photosensitive drum.

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3. The light beam scanning apparatus according to claim 1 or 2, wherein the light beams are scanned perpendicularly to the surface of the photosensitive drum in the main scanning direction, and intervals between the spots formed by the light  
10 beams are regular.

4. The light beam scanning apparatus according to claim 1 or 2, wherein the light beams viewed in the main scanning direction have a waist (W) satisfying a condition of  $W > r(1 - \cos\phi)\tan\theta$ .  
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5. The light beam scanning apparatus according to claim 2, wherein the focus of the light beams viewed in the sub-scanning direction is located at the central axis of the  
20 photosensitive drum and the spots of the light beams viewed in the main scanning direction are vertically formed on the surface of the photosensitive drum in a linear shape by controlling a curvature of the cylinder lens, a distance between the cylinder lens and the plus lens, and a focal  
25 length of the plus lens in conjunction with each other.

6. The light beam scanning apparatus according to claim 2, wherein the cylinder lens and the plus lens are implemented by a single equivalent lens, which has different dioptric powers in the main scanning direction and the sub-scanning direction, and in which a focus of light beams focused by the equivalent lens is located at the central axis of the photosensitive drum when viewed in the sub-scanning direction, and spots of the light beams are vertically formed on the surface of the photosensitive drum in a linear shape when viewed in the main scanning direction.

7. The light beam scanning apparatus according to claim 6, wherein the equivalent lens is a Y-toric, aspheric lens.

8. The light beam scanning apparatus according to claim 2, further comprising a minus lens disposed between the cylinder lens and the plus lens to outwardly diffract light beams passing through the cylinder lens.

9. A light beam scanning apparatus, in which light beams scanned from an image head form spots on a photosensitive drum to form an image, the image head comprising:

a light emitting source;

a collimator lens for converting a light beam emitted

from the light emitting source to a parallel beam;

an optical modulator for modulating the light beam, converted to the parallel beam by the collimator lens, to generate multiple beams; and

5 a lens system for allowing the multiple beams output from the optical modulator to form spots on a surface of the photosensitive drum in a linear shape along a vertical direction of the surface thereof; and

wherein a focus of light beams having passed through the  
10 lens system is formed at a central axis of the photosensitive drum when viewed in a sub-scanning direction, thus enabling spots of the light beams to be vertically formed on the surface of the photosensitive drum in a linear shape when viewed in a main scanning direction.

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10. The light beam scanning apparatus according to claim 9, wherein the lens system comprises:

a cylinder lens for refracting the multiple beams output from the optical modulator in the main scanning direction; and

20 a plus lens for focusing multiple beams having passed through the cylinder lens on the photosensitive drum.

11. The light beam scanning apparatus according to claim 9 or 10, wherein the light beams are scanned perpendicularly  
25 to the surface of the photosensitive drum in the main scanning

direction, and intervals between the spots formed by the light beams are regular.

12. The light beam scanning apparatus according to claim  
5 9 or 10, wherein the light beams viewed in the main scanning direction have a waist (W) satisfying a condition of  $W > r(1 - \cos\phi)\tan\theta$ .

13. The light beam scanning apparatus according to claim  
10 10, wherein the focus of the light beams viewed in the sub-scanning direction is located at the central axis of the photosensitive drum and the spots of the light beams viewed in the main scanning direction are vertically formed on the surface of the photosensitive drum in a linear shape by  
15 controlling a curvature of the cylinder lens, a distance between the cylinder lens and the plus lens, and a focal length of the plus lens in conjunction with each other.

14. The light beam scanning apparatus according to claim  
20 10, wherein the cylinder lens and the plus lens are implemented by a single equivalent lens, which has different dioptric powers in the main scanning direction and the sub-scanning direction, and in which a focus of light beams focused by the equivalent lens is located at the central axis  
25 of the photosensitive drum when viewed in the sub-scanning

direction, and spots of the light beams are vertically formed on the surface of the photosensitive drum in a linear shape when viewed in the main scanning direction.

5        15. The light beam scanning apparatus according to claim 14, wherein the equivalent lens is a Y-toric, aspheric lens.

16. The light beam scanning apparatus according to claim 10, further comprising a minus lens disposed between the  
10 cylinder lens and the plus lens to outwardly diffract light beams passing through the cylinder lens.

17. An image forming system comprising the light beam scanning apparatus of claim 1 or 9.